

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Allowed: Previously Presented): An isolated nucleic acid encoding  
UDP-N-acetylglucosamine: galactose- $\beta$ 1,3-N-acetylgalactosamine- $\alpha$ -R /  
N-acetylglucosamine- $\beta$ 1,3-N-acetylgalactosamine- $\alpha$ -R  $\beta$ 1,6-N-acetylglucosaminyltransferase  
(C2/4GnT) having the amino acid sequence SEQ ID NO: 2 or an enzymatically active  
fragment thereof.

Claim 2 (Allowed: Original): An isolated nucleic acid as defined in claim 1, wherein said  
nucleic acid is DNA.

Claim 3 (Allowed: Original): An isolated nucleic acid as defined in claim 2, wherein said DNA  
is cDNA.

Claim 4 (Allowed: Original): An isolated nucleic acid as defined in claim 2, wherein said DNA  
is genomic DNA.

Claim 5 (Allowed: Previously Presented): An isolated nucleic acid encoding  
UDP-N-acetylglucosamine: galactose- $\beta$ 1,3-N-acetylgalactosamine- $\alpha$ -R/N-acetylglucosamine-  
 $\beta$ 1,3-N-acetylgalactosamine- $\alpha$ -R  $\beta$ 1,6-N-acetylglucosaminyl-transferase (C2/4GnT), wherein  
said nucleic acid comprises the sequence of nucleotides 1-2319 in SEQ ID NO:1 or  
sequence-conservative variants thereof.

Claims 6-7 (Cancelled)

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Claim 8 (Allowed: Previously Presented): A nucleic acid vector comprising the nucleic acid of claim 1.

Claim 9 (Allowed: Previously Presented): A vector as defined in claim 8, wherein said nucleic acid comprises the nucleotide sequence of nucleotides 1-2319 in SEQ ID NO:1 or sequence-conservative variants thereof.

Claim 10 (Allowed: Original): A vector as defined in claim 9, wherein said sequence encoding C2/4GnT is operably linked to a transcriptional regulatory element.

Claim 11 (Allowed: Original): A cell comprising a vector as defined in claim 8.


Claim 12 (Allowed: Original): A cell comprising a vector as defined in claim 10.

Claim 13 (Allowed: Original): A cell as defined in claim 12, wherein said cell is stably transfected with said vector.

Claim 14 (Allowed: Original): A cell as defined in claim 11, wherein said cell produces enzymatically active C2/4GnT.

Claim 15 (Allowed: Original): A cell as defined in claim 11, wherein said cell is selected from the group consisting of bacterial, yeast, insect, avian, and mammalian cells.

Claim 16 (Allowed: Original): A cell as defined in claim 14, wherein said cell is selected from the group consisting of bacterial, yeast, insect, avian, and mammalian cells.

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Claim 17 (Allowed: Original): A cell as defined in claim 16, wherein said cell is Sf9.

Claim 18 (Allowed: Original): A cell as defined in claim 16, wherein said cell is CHO.

Claim 19 (Allowed: Previously Presented): A method for producing C2/4GnT polypeptides, which comprises:

- (i) introducing into a host cell the isolated nucleic acid of claim 1 or the nucleic acid vector of claim 8;
- (ii) growing the host cell under conditions suitable for human C2/4GnT expression;
- and
- (iii) isolating C2/4GnT produced by the host cell.

Claim 20 (Currently Amended): A method as defined in claim 19, wherein said enzymatically active C2/4GnT is selected from the group consisting of:

- (i) a polypeptide having the sequence of SEQ ID NO:2;
- (ii) a polypeptide consisting of amino acids 31-438 of the sequence of SEQ ID NO:2; and
- (iii) a fusion polypeptide comprising at least amino acids 31-438 of the sequence of SEQ ID NO:2 fused in frame to a second sequence, wherein said second sequence comprises an affinity ligand or a reactive group; and
- (iv) ~~function conservative variants of any of the foregoing.~~

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Claim 21 (Currently Amended): A method for the identification of DNA sequence variations in a region of the C2/4GnT gene, comprising the steps of:

- (i) isolating DNA from a patient;
- (ii) amplifying ~~C2/4GnT genomic regions~~ by PCR a segment of the patient's DNA comprising a region that is, wherein the amplified genomic regions are at least 95% identical to a subsequence of SEQ ID NO: 1 selected from the group consisting of nucleotides 1-245, nucleotides 246-435, and nucleotides 436-2319 of SEQ ID NO: 1; and
- (iii) detecting the presence of DNA sequence variation in said region by DNA sequencing, or single strand conformational polymorphism (SSCP) ~~or mismatch mutation~~.

Claim 22 (Allowed: Previously Presented): An isolated nucleic acid as defined in claim 1, wherein said nucleic acid comprises the nucleotide sequence of nucleotides 496-1812 in SEQ ID NO:1 or sequence-conservative variants thereof.

Claim 23 (Previously Presented): An isolated nucleic acid as defined in claim 1, wherein said nucleic acid comprises the nucleotide sequence of nucleotides 634-1812 in SEQ ID NO:1 or sequence-conservative variants thereof.

Claim 24 (Currently Amended): A method for screening for DNA sequence variations in a region of the human C2/C4GnT C2/4GnT gene comprising the steps of:

- (i) amplifying a segment of genomic DNA obtained from a human subject, said segment comprising a region having at least 95% sequence identity with a subsequence of SEQ

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ID NO: 1 selected from the group consisting of nucleotides 1-245, nucleotides 246-435, and nucleotides 436-2319 an exon of a polynucleotide having the sequence of SEQ ID NO: 1; and

(ii) comparing the sequence of said region of the amplified segment with said subsequence of SEQ ID NO: 1 and identifying the differences between the sequence of said segment region and said subsequence the corresponding exon of SEQ ID NO:1.

Claim 25 (Allowed: Previously Presented): A nucleic acid vector comprising the nucleic acid of claim 22.

Claim 26 (Previously Presented): A nucleic acid vector comprising the nucleic acid of claim 23.

Claim 27 (Previously Presented): A method for producing C2/4GnT polypeptides, which comprises:


(i) introducing into a host cell the isolated nucleic acid of claim 23 or the nucleic acid vector of claim 26;

(ii) growing the host cell under conditions suitable for human C2/4GnT expression; and

(iii) isolating C2/4GnT produced by the host cell.

Claim 28 (Allowed: Previously Presented): A cell comprising a vector as defined in claim 25.

Claim 29 (Previously Presented): A cell comprising a vector as defined in claim 26.


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Claim 30 (New): An isolated nucleic acid encoding UDP-N-acetylglucosamine: galactose- $\beta$ 1,3-N-acetylgalactosamine- $\alpha$ -R/N-acetylglucosamine- $\beta$ 1,3-N-acetylgalactosamine- $\alpha$ -R  $\beta$ 1,6-N-acetylglucosaminyl-transferase (C2/4GnT), wherein said nucleic acid comprises a nucleotide sequence that is more than 90% identical to nucleotides 1-2319 of SEQ ID NO: 1.

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